FACT SHEET

Dodge Caravan

Ethanol-Fueled Minivan

The U.S. Department of Energy (DOE) is promoting the use of alternative fuels and alternative fuel vehicles (AFVs). To support this activity, DOE has directed the National Renewable Energy Laboratory (NREL) to conduct projects to evaluate the performance and acceptability of light-duty AFVs. We tested a pair of 1998 Dodge Grand Caravans that were identical in all respects. For comparison, we designated one vehicle as the FFV candidate, to be tested on E85 and gasoline. The other vehicle, considered the "control," was operated on gasoline only. Each vehicle was run through a series of tests, explained briefly below. Each of these procedures has a page, on the vehicle evaluation website, with detailed descriptions.

Acceleration: Three tests performed (1) elapsed time from a standstill to 60 mph at wide open throttle, loaded and unloaded; (2) elapsed time from 40 to 60 mph at wide open throttle (passing simulation); (3) elapsed time and maximum speed at a quarter mile. Values are the average of six measurements.

Braking: Dry surface is concrete, wet surface is low friction Jennite pad. Minimum stopping distance from 62 mph (100 km/h) on dry surface, and from 31 mph (50 km/h) on wet surface with no wheels locked. Panic stops are minimum measured distance from 31 mph (50 km/h) on wet and dry surfaces at maximum pedal pressure with no attempt to steer. Values are average of six stops.

Fuel Economy: City fuel economy determined using an urban driving cycle—a distance of 2 miles with 8 stops. Highway fuel economy used a 70 mph average driving cycle with no stops. The 150 mile trip alternated between urban and highway cycles until 150 miles was reached. Results are reported in 70% highway driving for total trip.

Cold Start: Vehicle placed in a temperature-controlled room at -20°F for first test (minimum soak time 12 hr*). Crank time and idle rating recorded. If start successful, procedure repeated at -20°F for confirmation. If start unsuccessful, procedure repeated at higher temperature until minimum temperature is determined.

Driveability and Handling: Four different drivers rated each aspect of the vehicles; final rating is average of the four.

Emissions: Duplicate tests performed on each vehicle using EPA's Federal Test Procedure. AFV tested on both E85 and gasoline.

*Soak time allows the vehicle to stabilize at a given temperature

For the 1998 model year, Chrysler Corporation has equipped its lineup of minivans with an optional 3.3 L V6 engine capable of operating on E85 (85% ethanol and 15% gasoline), unleaded gasoline, or any blend of the two. These vehicles, known as flexible-fuel vehicles (FFVs), perform and operate the same as comparable gasoline models. Their flexibility eliminates the worry of choosing the fuel—use E85 when it's available, and fill up with unleaded gasoline when it's not. The 3.3 L flexible-fuel engine has a control system that determines the percentage of ethanol in the tank and automatically adjusts the engine's operating parameters for maximum efficiency.

The Chrysler lineup includes the 1998 Dodge Caravan and Grand Caravan, Plymouth Voyager and Grand Voyager, and Chrysler Town & Country.

General Description

	E85 Caravan*
Engine:	
Displacement	3.3 liter
Configuration	V6
Transmission	4-speed automatic
Fuel system	Multipoint fuel injection
Engine Family Code	WCRXT03.32BP
Capacities:	
Fuel	20 gal.
Passengers	2 front/5 rear
Cargo (cu ft)	168.5
Dimensions:	
Length	199.6 in
Width	76.8 in
GVWR**	5350 lbs

Other options:
Both vehicles are also equipped with air conditioning, tilt wheel, power steering, power brakes, power door locks and windows, antilock brakes (ABS), and cruise control.

* Because all of the 3.3L minivans are ethanol compatible, the two vans tested were identical.

**gross vehicle weight rating

Performance

	AFV-Ethanol	AFV-Gasoline	Gasoline Model
Acceleration			
0-60 mph loaded (sec)	13.84	13.84	14.18
0-60 mph unloaded (sec)	11.57	11.73	11.69
40 to 60 mph (sec)	6.09	5.96	6.09
1/4 mile time (sec)	18.53	18.69	18.59
1/4 mile speed (mph)	74.48	74.28	74.30
Fuel Economy			
City	11.5	15.1	15.7
Highway	15.9	22.2	22.1
Combined City/Highway	13.8	18.4	18.7

Braking	AFV-Ethanol		Gasoline Model	
Effectiveness stops:	meters	feet	meters	feet
62 mph (100 kph) dry pavement	54.97	180.36	51.82	170.02
31 mph (50 kph) wet jenite	30.63	100.50	31.22	102.43
Panic stop				
31 mph (50 kph) dry pavement	14.08	46.20	13.90	45.61
31 mph (50 kph) wet jenite	31.70	104.01	32.32	106.04

Cold Start Temperature °F	AFV-Ethanol crank time	AFV-Ethanol idle rating	AFV-Gasoline crank time	AFV-Gasoline idle rating	Gasoline Model crank time	Gasoline Model idle rating
-20	did not start		3 sec	7	3 sec	7
-15	12 sec	7				

Idle ratings from 1 to 9, 1 being lowest rating

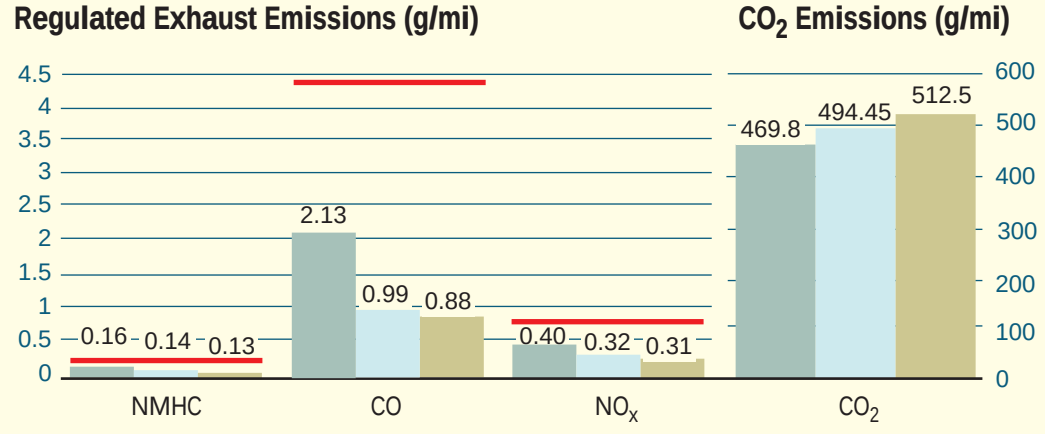
Subjective Ratings:

	AFV-Ethanol	AFV-Gasoline	Gasoline Model
Routine handling	■	■	■
Emergency handling	■	■	■
Acceleration	■	■	■
Braking	★	■	★
Ride; fully loaded	■	■	■
Ride; lightly loaded	★	■	■
Noise	■	■	■
Driving position	■	■	■
Front seat comfort	■	★	★
Rear seat comfort	★	★	★
Climate control	★	★	★
Access	★	★	★
Controls & displays	■	■	■
Trunk	■	■	■

★= Excellent ■= Good ● = Fair ❍= Poor ❒= Very Poor

Emissions

AFV-Ethanol AFV-Gasoline Gasoline Tier 1



Evaluation Summary

Evaluation results from a Caravan tested on E85 and one tested on gasoline showed no major differences for acceleration, braking, and driveability and handling. Evaluators reported that both vehicles were stable during braking, including emergency stops, and that acceleration was smooth with no engine hesitation. The cargo area was viewed as versatile, with the ability to hold different combinations of passengers or cargo, but the removal of the rear seats proved somewhat difficult for one person. Cold start tests at -20°F for the vehicle tested on gasoline were successful. The Caravan tested on E85 did not start at -20°F, but a subsequent test on E85 at -15°F proved successful. Although it took 12 seconds to start the engine, the idle rating was the same as the gasoline tests. Emissions for both fuels were well below EPA standards (certified to Federal Tier 1 levels). Emissions of potency weighted toxics from the E85 tests were 54% lower than the gasoline tests*.

* For more information on the calculation of potency weighted toxic emissions see the section on emissions on the website (www.afdc3.nrel.gov/demo proj/ldv/nve).

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